

Generalized Geophysical Retrieval and Analysis Tool for Planetary Atmospheres, Phase I

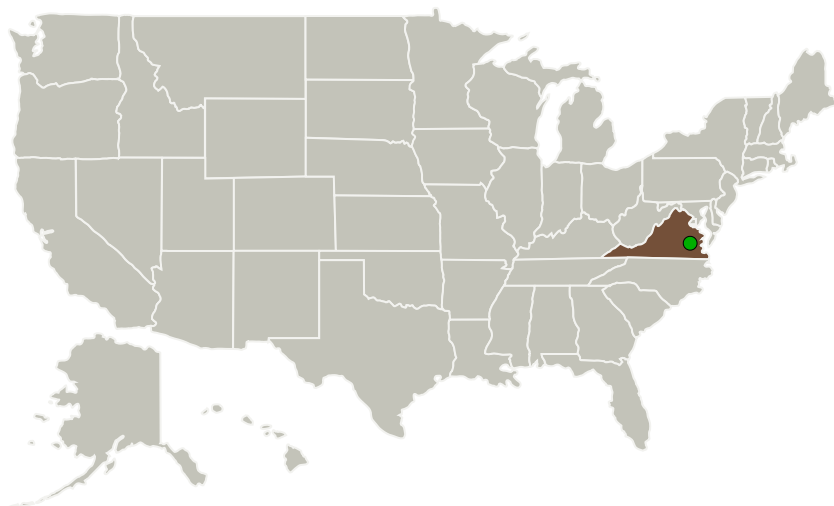
Completed Technology Project (2011 - 2011)



Project Introduction

CPI proposes to develop an innovative, generalized retrieval algorithm and analysis tool (GRANT) that will facilitate analysis of remote sensing data from both terrestrial and planetary atmospheres, and that is applicable to a wide range of NASA's remote sensing missions. GRANT will be based upon a generic and flexible implementation of the optimal estimation inversion technique for atmospheric retrievals (OPT), and be driven by a state-of-the-art FUV-NIR atmospheric radiance model (AURIC) for its forward model. GRANT will possess a flexible, user-configurable sensor model for generating realistic simulated data that tailors the retrieval algorithm to a specific sensor and measurement system. The anticipated Phase I result will be a working prototype analysis tool for application to terrestrial and planetary atmospheres. This prototype will be validated against a focused set of existing retrieval algorithms using remote sensing data from several NASA and DoD sensors. Phase II will yield a prototype that includes additional retrievable geophysical parameters, has a graphical user interface, incorporates a detailed formal error analysis capability, and has improved forward modeling capabilities such as energetic particle transport and enhanced Visible/IR modeling. The TRL levels at the start and end of Phase I are estimated to be 3 and 4, respectively.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Computational Physics, Inc.(CPI)	Lead Organization	Industry	Springfield, Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Virginia

Project Transitions

**February 2011:** Project Start**September 2011:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138182>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Computational Physics, Inc. (CPI)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

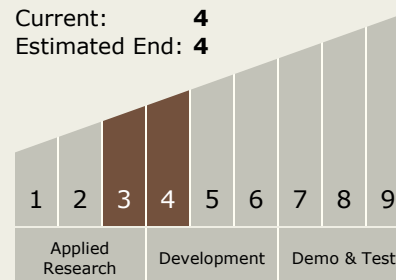
Jerry D Lumpe

Technology Maturity (TRL)

Start: 3

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.3 Simulation
 - └ TX11.3.6 Uncertainty Quantification and Nondeterministic Simulation Methods

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System